

What L2 Learners' Processing Strategy Reveals about the Modal System in Japanese: A Cue-based Analytical Perspective*

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Abstract. Japanese does not exhibit deontic-epistemic polysemy which is recognized among typologically different languages. Hence, in Japanese linguistics, it has been debated which of the two types of modality is more prototypical. This study brings Chinese learner's acquisition data of Japanese modality to bear on the question of which of the two types of modality is more prototypical, using the Competition Model (Bates and MacWhinney 1981). The Competition Model notion of 'cues' as processing strategy adopted by learners reveals the continuity/discontinuity between these two modality domains.

Keywords: prototype, the Competition Model, cues, processing strategy

1. Introduction

It is cross-linguistically not uncommon for a single modal marker to represent both deontic modality (the conditioning factors being external to the relevant individual) (Palmer 2001: 9) and epistemic modality (speakers' judgments about the factual status of the proposition) (ibid: 8), as in English *should*. This phenomenon is defined as polysemy (Traugott & Dasher 2002: 9). The deontic-epistemic polysemy is considered as a typologically prevalent tendency (Bybee et. al. 1994).

Unlike this cross-linguistic tendency, deontic modality and epistemic modality are generally encoded by two distinctive modal markers in Japanese.

This raises an intriguing question as to whether deontic is more prototypical than epistemic modality, or vice versa, or neither is. The aim of this study is to analogize the relationship between deontic modal markers and epistemic modal markers in Japanese based on the data of Chinese speakers' L2 acquisition.

2. Deontic-epistemic polysemy in cognitive linguistics and grammaticalization

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The phenomenon of polysemy between deontic and epistemic modalities is observable among typologically different languages, therefore this phenomenon is considered as a cross-linguistically prevalent tendency. There are two main approaches which propose to account for the deontic-epistemic polysemy prevalent across languages, i.e. (I) the **polysemic approach** and (II) the **monosemic approach**.

2.1. The polysemic approach

According to recent studies of cognitive linguistics (Sweetser 1990) and of grammaticalization (Bybee et al. 1994, Traugott and Dasher 2002), the deontic-epistemic modality results from the cognitive-diachronic process whereby epistemic modal meaning derives from deontic epistemic modal meaning rather than vice versa. For example, Sweetser (1990) explains this process as in (1).

(1) John *must* be at home right now.

The sentence (1) can be interpreted in two ways: (i) John is obliged to be at home (deontic usage of *must*) and (ii) the circumstance compels the speaker to judge that John is at home (epistemic usage of *must*). Deontic usage implies that the force-dynamics in a real world imposed by the speaker and/or other several actors compels the subject (or others) to perform a certain action. Epistemic usage suggests that cognitive force employed by a certain actor compels the speaker (or people in general) to reach the conclusion described in a sentence. There is parallelism in force dynamics between deontic and epistemic usages. Force dynamics in a socio-physical domain derives force dynamics in a cognitive domain. Therefore, it is considered that deontic usage derives epistemic usage and the former is more prototypical than the latter.

2.2. The monosemic approach

There is another approach to explain the relationship between deontic and epistemic modalities. This approach, referred to as the ‘monosemic’ approach, was advocated by Kratzer (1981). It proposes that each modal marker generally contains a common core meaning which covers several different interpretations. Papafragou (2000) developed Kratzer’s approach and proposed that the interpretation of modal meaning is context-dependent, by adopting the ‘relevance theory’ by Sperber and Wilson (1995).

The monosemic approach was proposed because there are some cases which cannot be explained by the ‘polysemic’ approach. While the polysemic approach regards a semantic change from deontic to epistemic modality as metaphoric mapping in force-dynamics from socio-physical domains to epistemic domains, the monosemic approach regards modal meanings as clear-cut, i.e. either deontic or epistemic. Contrary to the polysemic approach, the monosemic approach proposes that modal meaning is not determined by *a priori* but is determined by specific contexts.

3. A cognitive account for the absence of deontic-epistemic polysemy in Japanese

As noted in Section 1, modal markers in Modern Japanese generally fail to exhibit the deontic-epistemic polysemy. For example, the deontic modal sense of *should* is encoded by a periphrastic modal marker *bekida*, while its epistemic modal sense is encoded by another periphrastic marker *hazuda*. This tendency is further exemplified by another set of modal markers *nakerebanaranai* and *nichigainai*. Both are translated into English *must*: the deontic modal sense of *must* corresponds to *nakerebanaranai*, while its epistemic modal sense corresponds to *nichigainai*.

The virtual non-existence of deontic-epistemic polysemy in Japanese suggests that the relationship between deontic modal markers and epistemic modal markers cannot be explained by the cross-linguistically observable unidirectional grammaticalization process of modal markers. Yamada (1990) thus maintains that both categories of modality originated independently and that neither of them is more prototypical than the other. This view accords with the monosemic approach in that both views consider that deontic modality and epistemic modality are distinctive cognitive domains.

The other approach maintains that epistemic modality derives deontic modality and, therefore, epistemic modality is more prototypical than deontic modality in Japanese, unlike the cross-linguistically prevalent reverse tendency (Kurotaki 2005). This approach is similar to the polysemic approach in that both approaches consider deontic and epistemic modal meanings to be continuous.

A most common method to examine the prototypicality of modal meaning in a language is to examine the process of diachronic grammaticalization in that language. Grammaticalization in the area of modality refers to the process of semantic change of modal markers: the prototypical meaning emerged earlier than the peripheral one. The evidence of diachronic grammaticalization, however, is not available to explain the prototypicality of Japanese modal markers, because the development of the modal markers in Modern Japanese is apparently independent of the modal markers in Classical Japanese (Onoe 2001). Therefore, we examine the relationship between deontic modal markers and epistemic modal markers using the data of second language acquisition as an alternative method.

4. Studies of Chinese learners' acquisition of Japanese modal markers

4.1. The parallelism between L2 acquisition and diachronic grammaticalization

Certain parallelism between grammaticalization and the order of acquisition of polyfunctional words has been recognized in functional-cognitive linguistics. That is, the emergence and the acquisition of core meaning have been known to precede those of peripheral one. Recently, this parallel relationship was extended to a research program that describes the typological characteristics of grammaticalization of a language based on the language acquisition order of polysemous words (e.g. Giacalone-Ramat 2003, Giacalone-Ramat and Crocco-Gales 1995).

Unlike L1 acquisition, the order of L2 learners' acquisition of polysemous words does not involve the creation of new patterns of grammaticalization like diachronic grammaticalization. Instead, it demonstrates various ways of approximating to a subsystem (Giacalone-Ramat 2003:

28). Therefore, L2 acquisition, especially the strategy utilized by adult learners, recapitulates the internal factors of the diachronic grammaticalization in the target language more overtly than L1 acquisition. Hence, we consider that the data of second language acquisition will be an appropriate method in order to analogize the relationship between deontic and epistemic modal markers in Japanese.

4.2. The target and the hypothesis

According to the parallelism between the order of acquisition of meaning and diachronic grammaticalization, learners acquire more prototypical modal markers earlier than non-prototypical ones. This suggests that the modal marker acquired earlier is more prototypical. The notion of the parallelism between the order and the degree of prototypicality is also applicable to the acquisition of Japanese modal markers, in which deontic modality and epistemic modality are encoded by two distinct modal markers.

In this study, we will deal with the case of Chinese learners' acquisition of two pairs of Japanese modal markers *bekida/hazuda* and *nakerebanaranai/nichigainai*. *Bekida* and *hazuda* correspond to a single modal marker *ying¹gai¹* in Chinese, whereas *nakerebanaranai* and *nichigainai* correspond to a single modal marker *yao⁴* (the numbers indicate the intonation of Chinese: number 1 stands for flat tone, 2 for rising tone, 3 for falling-rising tone, and 4 for falling tone). Chinese is a language in which the deontic-epistemic polysemy is manifested, with the deontic meaning more prototypical than the epistemic meaning (Li 2003). The mapping patterns of deontic modal markers and epistemic modal markers and the degree of prototypicality are thus different between the two languages.

Our null hypotheses are that (i) learners acquire more prototypical modal markers earlier than non-prototypical ones, and that (ii) neither of deontic or epistemic meaning is more prototypical than the other if learners acquire them simultaneously. We define the survey of prototypicality based on the order of acquisition as the survey 1.

5. Survey 1: the prototypicality of Japanese modal markers based on the second language acquisition

5.1. Methodology

The tasks in Survey 1 were given in the form of multiple choice questions. Chinese learners of Japanese were instructed to choose one appropriate modal marker out of four alternatives for a question. Two out of four choices given were *bekida* and *hazuda*, which competed with each other. There were 20 questions in total. The learners had to choose *bekida* as the correct answers for 10 questions and *hazuda* for another 10 questions.

(2) is an example of the task. Learners are instructed to read the sentence and to choose the appropriate modal marker among the four alternatives. As demonstrated by (c) and (d), two out of the four alternatives are *bekida* and *hazuda*, which compete with each other.

- (2) *sake-wa* *tomokaku* *tabako-wa* ().
 alcohol-TOP if not tobacco-TOP
 ‘You () tobacco, if not alcohol.’
- (a) *herasa nai monoda* (b) *herasu wakeda*
 ‘do not naturally cut down on’ ‘no wonder cut down on’
- (c) *herasu hazuda* (d) *herasu bekida*
 ‘are supposed to cut down on’ ‘ought to cut down on’

In this experiment, Chinese learners were divided into 3 groups according to the results of a pretest (the grammar test of the second grade Japanese proficiency test), i.e. basic, intermediate, and advanced groups. Each group consisted of 20 examinees.

This task is developed based on the Competition Model (Bates and MacWhinney 1981). The Competition Model is a functionally oriented model for second language acquisition. The model is based on a functional theory of grammar wherein the relationship between the underlying meaning/intention and its expression in surface form is stated as directly as possible (Givón, 1979). Hence, this model is suitable to analyze the process of the acquisition of grammatical features where the form-meaning correspondences in L1 and L2 are in competition.

The tasks consisted of 20 questions for a pair *bekida/hazuda* and 20 questions for a pair *nakarebanaranai/nichigainai*. Out of 20 questions for the former pair, 10 questions required deontic *bekida* and the remaining 10 required epistemic *hazuda*. Similarly, out of 20 questions for the latter pair, 10 questions required deontic *nakarebanaranai* and the remaining 10 questions required epistemic *nichigainai*.

An analysis was conducted of the learners’ differential choice of modal markers for each block of 10 questions that required each modal marker as the correct answer from the viewpoints of L1 transfer and the development of interlanguage. Specifically we examined the learners’ differential choice of correct modal markers, i.e. the choice between the correct modal marker (e.g. *hazuda*) and the competing modal marker (e.g. *bekida*) and other modal markers (e.g. *monoda*) using a statistical test.

5.2 The results of Survey 1 and the examination of the prototypicality between modal markers

The figures below indicate the relationship between the choice of modal markers and the proficiency levels of learners for questions requiring each modal marker as the correct answer.

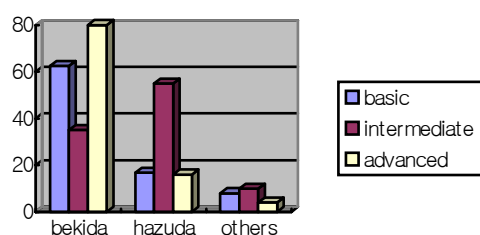


Figure 1. questions for *bekida*

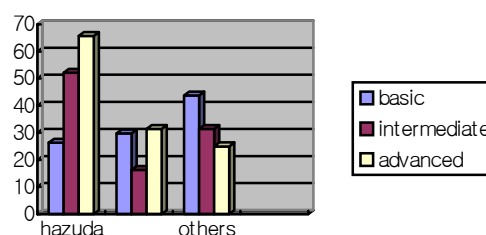
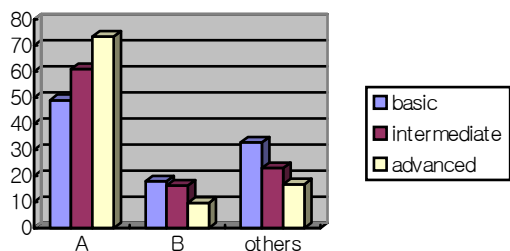
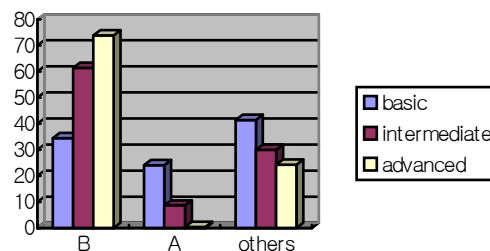


Figure 2. questions for *hazuda*



A: *nakerebanaranai* B: *nichigainai*
Figure 3. questions for *nakerebanaranai*



B: *nichigainai* A: *nakerebanaranai*
Figure 4. questions for *nichigainai*

The results of Surevey 1 are summarized as follows: (i) intermediate learners who incorrectly selected epistemic *hazuda* instead of the correct deontic *bekida* outnumbered basic and advanced learners; (ii) the number of learners who incorrectly selected epistemic *hazuda* for the questions requiring it instead of deontic *bekida* steadily increased in proportion to their proficiency level. These results suggest that (iii) Chinese learners' acquisition of *bekida* and *hazuda* is influenced in its beginning stage by their native language where deontic modality is more prototypical than epistemic modality, as suggested by the high accuracy rate of the deontic *bekida* usage; (iv) it then shifts to an 'interlanguage' stage characterized by the intermediate learners' overgeneralization of epistemic *hazuda*; (v) and finally the advanced learners' performance shows closer resemblance to that of Japanese native speakers as characterized by the gradual increase in the accuracy rate of the correct epistemic *hazuda* usage.

Unlike the acquisition of *bekida/hazuda*, learners at all levels tended to respond correctly to the questions respectively requiring *nakerebanaranai* or *nichigainai* as the correct answer. Thus, the learners could recognize that *nakerebanaranai* and *nichigainai* have different functions from the beginning and they did not go through the stage of 'interlanguage' on the process of the acquisition of *nakerebanaranai* and *nichigainai*

The acquisition process of two sets of modal markers suggests: **(I) modal meanings of *nakerebanaranai* and *nichigainai* developed independently as maintained by Yamada (1990); but (II) the stage of 'interlanguage' indicates that *hazuda* is more prototypical than *bekida* as maintained by Kurotaki (2005).** The greater degree of prototypicality of *hazuda* suggests that the monosemic approach is applicable to explain the relationship between *bekida* and *hazuda*. We will confirm this finding based on the processing strategy that the learners utilized in the next section and we define this task as survey 2.

6. Survey 2: the cue-based analysis

6.1. The parallelism between processing strategy and the notion of 'cue'

Similar to the parallelism between language acquisition and diachronic grammaticalization, there is arguably also a parallelism between the processing strategy adopted by adult L2 learners and the internal factors of diachronic grammaticalization. The notion of 'cue' employed in the Competition Model is a useful method to describe this parallelism.

The connector between the underlying meaning and its surface manifestation is defined as a ‘cue’. This term includes all the information utilized by speakers and hearers to determine the relationship between form and meaning. Cues include case-marking particles, word order, inflectional morphology etc (MacWhinney 1987). This model focuses on the understanding of sentence processing, therefore cues normally refers to surface forms of the sentences that activate the underlying function utilized by listeners. Hence, the differences in surface forms between deontic and epistemic modal markers can be the cue for learners to differentiate both modalities.

6.2. The definition of cues for survey 2

Tables 1 and 2 represent a cluster of formal/grammatical features respectively characterizing deontic modality and epistemic modality in Japanese.

Table1. Cues for deontic *bekida* in Japanese

Grammatical Subject	Explicit or implicit, [+ volitional, +animate]
Predicate	Action verb
Negation	Negative form of the modal marker (~ <i>suru beki dewa nai</i>)
Tense	Past form of the modal marker (~ <i>suru beki datta</i>)
Voice	Active

Table 2. Cues for epistemic *hazuda* in Japanese

(Semantic) subject	The speaker
Thematic subject	Explicit or implicit, [+ or – animate]
Predicate	Verb, noun, adjective
Negation	Negative form of the modal marker (~ <i>suru beki dewa nai</i>) Negative form of the embedded predicate (~ <i>shi nai hazuda</i>)
Tense	Past form of the modal marker (~ <i>suru beki datta</i>) Past form of the embedded predicate (~ <i>shita hazuda</i>)
Voice	Active, passive, potential

From Tables 1 and 2, it is obvious that an epistemic modal marker *hazuda* has more variable surface formal manifestations than its deontic counterpart *bekida*. Some formal (or grammatical) features are specific to *hazuda* such as the possible occurrence of an inanimate subject, of noun and adjective in the predicate position, the availability of a negative, past, passive or potential

form of the embedded predicate. Therefore, we can presume that learners are guided by these formal features to become sensitized to the usage conditions/constraints on epistemic *hazuda*.

On the other hand, sentences with deontic *bekida* can have its animate subject present or absent and typically co-occur with a volitional action verb. These formal features might be employed by learners as possible cues to distinguish deontic *bekida* from epistemic *hazuda*.

However, there can be a sentence with epistemic *hazuda* whose surface structure is identical to that with deontic *bekida*. e.g. an epistemic sentence with the animate subject and the present action verb. This is exemplified by the example (3) below.

- (3) *Furaipan de sakana wo yaku toki wa, bataa wo yoku tokasu ().* .
frying pan by. fish ACC fry when TOP, butter ACC well melt should.
'When you fry fish using frying pan, you should melt butter well.'

In fact, this sentence can receive either deontic or epistemic interpretation and both *bekida* and *hazuda* are available in the blacket.

Kail (1989) categorized the types of cues into two types, **local cues** and **global cues** according to the difference of the amount of effort in the sentence processing. Local cues refer to the cues requiring local processing. In the case of local cues, we can recognize particular usage based on one lexical word and it is not necessary to consider other lexical words. On the other hand, global cues require topological processing in which we need to consider other lexical words.

According to this definition, the cues exclusive to epistemic usage and the cues typical to deontic usage are local cues. In contrast, the cues for example (3) are global cues.

The subject (the person executing certain action) in (4) is implicit, but it is possible to interpret (3) as (a) a generic statement by the speaker (epistemic usage) and (b) a specific situation where the speaker requires a particular person to perform certain action (deontic usage). The difference between (a) and (b) corresponds to the view of the monosemic approach that maintains the difference of deontic and epistemic usages is contextual. This implies that the global cue is the core/common meaning between two usages as the monosemic approach stated.

Unlike the case of *bekida* and *hazuda*, there are no global cues between *nakerebanaranai* and *nichigainai*. For example, a sentence contains an animate subject and a present tense of action verb can be interpreted as both deontic and epistemic meanings. However, there is a difference in the surface forms when the verb prefix to *nakerebanaranai* and to *nichigainai*. The sentences (4) and (5) exemplify the difference.

- (4) *Okureru toki wa renraku shi nakerebanaranai*

Late. Time TOP contact do.must.

(When you are late,) you must make a contact to us.

- (5) *Okureru toki wa renraku suru nichigainai.*

(When you are late,) you must make a contact to us.

When the present tense of an action verb *suru* ('do') is attached to a modal *nakerebanaranai*, it becomes inflected and changes to *shi* like (4). On the other hand, the same verb *suru* does not alter its form when it is attached to *nichigainai* like (5).

6.3. The result of Survey 2

The analysis of cues thus reveals that *bekida/hazuda* has a global cue and *nakerebanaranai/nichigainai* does not. According to Kail (1989), a local cue is easier to acquire than a global cue due to the amount of the effort in the processing. There is no global cue between *nakerebanaranai* and *nichigainai*, therefore learners could perceive two modal markers have different functions from the beginning of the acquisition. On the other hand, the existence of global cue between *bekida* and *hazuda* makes it difficult for learners to distinguish them.

The cue-based analysis of the acquisition of *bekida/hazuda* demonstrates that learners utilized different types of cues. Basic level Chinese learners of Japanese tend to choose deontic *bekida* not only in questions requiring it as the correct answer but also in questions requiring epistemic *hazuda*. This is a possible instance of transfer from the knowledge of L1 (where the deontic sense of *ying1gai1* is primary and prototypical) in processing an L2 sentence. Unlike basic learners, intermediate learners performed well for the questions requiring epistemic *hazuda*. These learners, however, tended to choose *hazuda* for the questions requiring deontic *bekida*. These findings imply that intermediate learners utilizes epistemic local cue. They attempted to utilize global cue rather than to utilize deontic local cue independently. Advanced learners can choose appropriate modal markers according to the contexts, which means that these learners can utilize all types of cues correctly. The strategy employed by intermediate learners and that by advanced learners indicate that the existence of continuity between *bekida* and *hazuda* and that the difference between them is determined by the contexts. This suggests that the monosemic approach is more appropriate in explaining the relationship between these two modal markers.

7. Conclusion

This study examined the prototype relationship between deontic modality and epistemic modality in Japanese based on Chinese learners' L2 acquisition data. Two pairs of periphrastic modal markers in Japanese *bekida/hazuda* and *nakerebanaranai/nichigainai*, which respectively correspond to single modal markers in Chinese, were objects of our inquiry. In both cases, the mapping correspondence of modal markers between Chinese and Japanese is 1:2. Nevertheless, the results of Chinese learners' acquisition of *bekida/hazuda* and *nakerebanaranai/nichigainai* were shown to be different. This result has the following implication for considering the relationship between deontic and epistemic modalities in Japanese. Though the two semantic categories are formally coded by different periphrastic modal markers, unlike their counterparts in languages like English and Chinese, there are cases where the two categories are in a pseudo-prototype relationship, i.e. epistemic modality being more prototypical than deontic modality, as exemplified by the pair *bekida/hazuda*. Conversely, there are also cases where the two categories are discontinuous, as in the pair *nakerebanaranai/nichigainai*.

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